

# HW08 - Chemistry of Nutrition & Booze

1 6 points

Anemia is a common health condition that can result from insufficient dietary iron intake. Iron is one of the rare micronutrients where different daily intakes are recommended for men and women. It has been determined that women should consume 18mg per day, while men only need to consume 8mg per day. Using the provided table of iron info for several foods, evaluate two hypothetical diets. Would these diets provide sufficient iron?  $3.5 \text{ oz} = 100 \text{ g}$

Food	mg iron per 100 g food
Ground beef	2.5
Cooked lentils	3.3
Raw spinach	2.7
Pumpkin seeds	9
Dark chocolate	4.2
Tofu	1.7
Eggs	1.9

Diet A Food Sources	Diet A Daily Quantities
Ground beef	5 oz
Raw spinach	2 oz
Pumpkin seeds	1 oz
Eggs	3 oz

Diet B Food Sources	Diet B Daily Quantities
Cooked lentils	6 oz
Raw spinach	4 oz
Dark chocolate	2 oz
Tofu	6 oz

- Diet A provides enough iron for men and women
- Both diets provide sufficient iron for anyone.
- Diet B provides enough iron for men and women
- Both diets meets the RDA for men, but neither meets the RDA for women

2 6 points

Lycopene is a compound responsible for red color in many vegetables, most notably tomatoes. Its molecular structure is below. Does lycopene behave more like Vitamin A or Vitamin C, in terms of how our bodies absorb and store it?



- Vitamin C
- Vitamin A

3 6 points

Below is the label from a can of spray oil, like one would use to coat a pan before baking or cooking. Is this truly a zero calorie product?

Nutrition Facts	
Serving Size 1/3 second spray (0.25g)	
Servings Per Container About 557	
Amount Per Serving	
<b>Calories</b> 0	Calories from Fat 0
% Daily Value*	
<b>Total Fat</b> 0g	<b>0%</b>
Saturated Fat 0g	<b>0%</b>
Trans Fat 0g	
Polyunsaturated Fat 0g	
Monounsaturated Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 0mg	<b>0%</b>
<b>Total Carbohydrate</b> 0mg	<b>0%</b>
<b>Protein</b> 0g	
Not a significant source of dietary fiber, sugars, vitamin A, vitamin C, calcium, and iron.	
*Percent daily values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400g 2,400g
Total Carb	300g 375g
Dietary Fiber	25g 30g

- Yes, the only calories are from fiber, which doesn't count
- No, there are a few fat calories, but the label rounded down.
- No, there is less than 1 Cal, so it is rounded down.
- Yes, this is made from Olestra

4 6 points

Match the mineral class to the mass units that best represent the necessary daily intake of that class.

Microminerals	_____
Trace minerals	_____
Macrominerals	_____

5 6 points

Which of these pairs represent the same unit of mass?

- mg, mcg
- microgram, mg
- µg, mcg

6 6 points

Vitamins and minerals are generally divided into which two groups?

- Microminerals and Macrominerals
- Letter and Numeric
- Water soluble and fat soluble
- Lipids and triglycerides

7 8 points

Below is the nutrition label from a packet of InstantLunch ramen.

Nutrition Facts	
4 servings per container	
Serving size 1 3/4 cups(258g)	
Amount per serving	
<b>Calories</b> 290	
% Daily Value*	
<b>Total Fat</b> 15g	<b>19%</b>
Saturated Fat 3.5g	<b>18%</b>
Trans Fat 0g	
<b>Cholesterol</b> 65mg	<b>22%</b>
<b>Sodium</b> 220mg	<b>10%</b>
<b>Total Carbohydrate</b> 14g	<b>5%</b>
Dietary Fiber 3g	<b>11%</b>
Total Sugars 4g	
Includes 0g Added Sugars	<b>0%</b>
<b>Protein</b> 24g	
Vitamin D 0mcg	<b>0%</b>
Calcium 50mg	<b>4%</b>
Iron 1mg	<b>6%</b>
Potassium 309mg	<b>6%</b>

Suppose a student decides to live on a budget and eats 8 servings per day, and nothing else. Select all the definitively true statements about this student's state of nutrition if they persist with this diet. (Assume the 2000 Cal diet on the label is an appropriate set of nutritive goals for this diet.)

- Malnourished, due to lack of at least one micronutrient
- An excessive intake of some macro- and micronutrients.
- Malnourished, due to lack of at least one micronutrient
- Malnourished, due to lack of calories
- Undernourished, due to lack of calories

8 8 points

Suppose our Ramen-eating student wants to improve their diet and at least avoid coming down with scurvy. Do a bit of research and select the food that is most likely to provide sufficient Vitamin C if eaten once per day. The RDA for Vitamin C is 60mg/day.

- 1 small orange
- 1 green bell pepper
- 1 lime

9 8 points

Using the macronutrient info, how many Calories do you expect to see (per serving) for this product?

Nutrition Facts	
32 servings per container	
Serving size 1 1/4 cup (28g)	
Amount Per Serving	
<b>Calories</b>	
% Daily Value*	
<b>Total Fat</b> 8g	<b>10%</b>
Saturated Fat 1g	<b>5%</b>
Trans Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 680mg	<b>30%</b>
<b>Total Carbohydrate</b> 23g	<b>8%</b>
Dietary Fiber 5g	<b>18%</b>
Total Sugars 4g	<b>18%</b>
Includes 5g Added Sugars	<b>10%</b>
<b>Protein</b> 5g	<b>10%</b>
Not a significant source of vitamin D, calcium, iron, and potassium	
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

Type your answer...

10 6 points

How many grams of fat would you calculate to be in a serving of this product?

Nutrition Facts	
32 servings per container	
Serving size 1 1/4 cup (28g)	
Amount Per Serving	
<b>Calories</b> 130	
% Daily Value*	
<b>Total Fat</b>	
Saturated Fat	
Trans Fat	
<b>Cholesterol</b> 5mg	<b>2%</b>
<b>Sodium</b> 180mg	<b>8%</b>
<b>Total Carbohydrate</b> 18g	<b>7%</b>
Dietary Fiber 1g	<b>4%</b>
Total Sugars 12g	
Includes 12g Added Sugars	<b>24%</b>
<b>Protein</b> 1g	<b>2%</b>
Not a significant source of vitamin D, calcium, iron, and potassium	
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

Type your answer...

11 6 points

The fundamental idea of distillation is that liquids can be separated based on...

- texture
- polarity
- boiling point
- charge balance

12 6 points

In a distillation of fermented mash, liquor distillers typically separate the first portion of distillate. The first portion...

- is too high in methanol content because methanol has a lower boiling point than ethanol
- is too high in ethanol content and must be discarded
- is the most delicious, and distillers keep it for themselves.
- is too high in methanol content because methanol has a higher boiling point than ethanol

13 6 points

Cocktails, just like any other "drink" can have very different calorie and alcohol contents, even when they have the same name. Use the table below to answer the next two questions about margaritas.

Ingredient	ABV	Carbs (sugar g/oz)
Tequila	40%	0
Orange Liqueur	40%	8
Lime Juice	0%	1
Margarita Mix	0%	6

A traditional preparation of a margarita is made of 2 oz of tequila, 1 oz of orange liqueur, and 1 oz of lime juice. How many "standard drinks" of alcohol and how many Calories does this contain?

- 2 drinks, ~230 Cal
- 3 drinks, ~300 Cal
- 3 drinks, ~200 Cal
- 2 drinks, ~35 Cal

14 6 points

You are more likely to encounter a margarita made from a mix in a restaurant. A typical offering would be a 12 oz cocktail, made from 3 oz of tequila and 9 oz of mix. How many "standard drinks" of alcohol and how many Calories does this contain? Assume the tequila is "standard" liquor and has 40% ABV.

- 3 drinks, 255 Cal
- 2 drinks, 350 Cal
- 2 drinks, 410 Cal
- 3 drinks, 350 Cal

15 4 points

What is/are the risks associated with using sucrose instead of glycerol to support the fatty acids and make a non-digestible monster fat (Olestra)?

- loose stools
- abdominal cramping
- inhibition of vitamin absorption
- anal leakage

16 6 points

Which functional group in sucrose allowed it to be used in place of glycerol to make Olestra?

- alcohol
- carboxylic acid
- amine
- phenyl